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28 NOV 1978

OCCS-M-78-169

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90.6.23

MEMORANDUM FOR: Chief, Engineering Division, OC
Chief, Foreign Networks Division, OC
Chief, [REDACTED]

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FROM : [REDACTED]
Chief, Communications Division, OC

SUBJECT : Recommended Security Enhancements for
ARS and MAXCON [REDACTED]

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1. [REDACTED] The attached MFR is the product of a cursory single fault analysis of the Automated Relay System (ARS) and MAXCON output circuitry. The analysis was performed by OC-CSD/EAB with OC-ED/CPS assistance. The simulation of a single fault, as described in paragraph 4, clearly demonstrates the potential for a compromise of classified information.

2. [REDACTED] We request that the paragraph 6 alternatives and procedures be implemented as enhancements to the security of the ARS and MAXCON systems. Implementation of these enhancements will effectively double the protection against the possibility of a compromise of classified information. The hardware changes recommended are a matter of strapping and can be effected in a relatively short period of time. The software changes should not be difficult since there is no apparent need for unique software development.

3. [REDACTED] will be available for verification testing if necessary.

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Attachments:
As stated

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Distribution:

Original - Addresses
1 - OC Record Copy File
1 - OC-CSD Chrono

COORD: (s) p. J.
C/OC-CSD/PDB

OC-CSD/EAB/CSDS [REDACTED] 20 Nov 78

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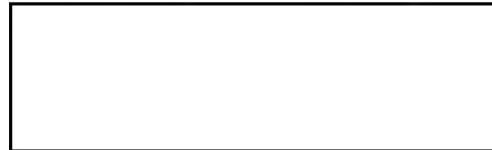
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b. Buss Addresses 767000g and 767400g are used for Maxcon/Record Channel interfacing.

Given a and b, there is no known addressing conflict.

25X1 8. ☐ This analysis has been confined primarily to the LCM, due to the fact that there are software/hardware addressing alternatives. An indepth analysis of a single LTU addressing failure was not made, since there are no alternatives to the existing LTU software/hardware addressing structure. Any change in this structure would require a redesign of the LTU integrated circuitry.



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Attachment:

Automated Relay System Addressing Structure, Figures 1,2,&3

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6. ☐ The following alternative addressing and operational procedures will enhance the security of the ARS.

a. By selectively choosing the LCM/LTU software/hardware addresses, ARS security protection will be doubled. These addresses are:

Buss Address Bits					
BA	11	10	9	8	
LCM 1	0	0	0	0 ₂	760002 ₈
LCM 2	0	0	1	1 ₂	761402 ₈
LCM 3	0	1	1	0 ₂	763002 ₈
LCM 4	1	0	1	0 ₂	765002 ₈
LCM 5	1	1	0	0 ₂	766002 ₈

Given the proposition that each "1" and "0" represents an integrated circuit, it is obvious that two IC failures vice one, would be required to produce the conditions described in the preceding paragraphs i.e., compromise of classified information.

b. Security may be further enhanced by a vertical re-alignment of station/LTU assignments according to category of traffic i.e., all LTU 0's for other agency, all LTU 1's for ☐ etc. It is recognized that this enhancement may not be totally possible/practical.

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c. Failures of this nature, produce an audible network alarm and LTU failure printouts at the circuit control position. The ARS SOP should include instructions for the communicator to immediately remove the LCM associated with the LTU failure printouts. This will disable the entire shelf.

7. The above changes should also be incorporated in the MAXCON (Max Concentrator). It should be noted that:

a. In the basic C900 (Collins 900) System, Buss Addresses 760000₈ through 762400₈ are used for CLCM (Communications Link Control Module) and TLM (Trunk Link Control Module) addressing. These Modules are not implemented in the ARS or the MAXCON.

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